

CLAIMS

What is claimed is:

1. A coating composition comprising:
 - 5 a crosslinkable component comprising an acid functional acrylic copolymer polymerized from a monomer mixture comprising 2 percent to 12 percent of one or more carboxylic acid group containing monomers, percentages based on total weight of the acid functional acrylic copolymer, and 0.2 percent to 2 percent of amorphous silica, percentages based on total weight of the
 - 10 crosslinkable component; and
 - a crosslinking component.
2. The coating composition of claim 1 wherein said acid functional acrylic copolymer has a GPC weight average molecular weight ranging from 8,000 to 100,000 and a polydispersity ranging from 1.05 to 10.0.
- 15 3. The coating composition of claim 1 or 2 wherein said acid functional acrylic copolymer has Tg ranging from -5°C to $+100^{\circ}\text{C}$.
4. The coating composition of claim 1 wherein said monomer mixture comprises one or more functional (meth)acrylate monomers and one or more non-functional (meth)acrylate monomers.
- 20 5. The coating composition of claim 4 wherein said monomer mixture comprises 5 percent to 40 percent based on total weight of the acid functional acrylic copolymer of said functional (meth)acrylate monomers.
6. The coating composition of claim 5 wherein said functional (meth)acrylate monomer is provided with one or more crosslinkable groups
- 25 selected from the group consisting of a primary hydroxyl, secondary hydroxyl and a combination thereof.
7. The coating composition of claim 1, 4, 5 or 6 wherein said functional (meth)acrylate monomer is selected from the group consisting of hydroxyethyl (meth)acrylate, hydroxypropyl (meth)acrylate, hydroxyisopropyl
- 30 (meth)acrylate, hydroxybutyl (meth)acrylate, and a combination thereof.
8. The coating composition of claim 1 said carboxylic acid group containing monomer comprises one or more carboxylic acids selected from the group consisting of (meth)acrylic acid, crotonic acid, oleic acid, cinnamic acid, glutaconic acid, muconic acid, undecylenic acid, itaconic acid, crotonic acid,
- 35 fumaric acid, maleic acid, and a combination thereof.

9. The coating composition of claim 4 wherein said non-functional (meth)acrylate monomer is selected from the group consisting of (meth)acrylate, ethyl (meth)acrylate, propyl (meth)acrylate, butyl (meth)acrylate, pentyl
5 (meth)acrylate, hexyl (meth)acrylate, octyl (meth)acrylate, nonyl (meth)acrylate, isodecyl (meth)acrylate, lauryl (meth)acrylate, isobutyl (meth)acrylate, t-butyl (meth)acrylate 2-ethylhexyl (meth)acrylate, cyclohexyl (meth)acrylate, methylcyclohexyl (meth)acrylate, trimethylcyclohexyl (meth)acrylate, tertiarybutylcyclohexyl (meth)acrylate, isobornyl (meth)acrylate and a
10 combination thereof.
10. The coating composition of claim 1 or 4 wherein said monomer mixture comprises styrene.
11. The coating composition of claim 1 wherein said crosslinking component comprises a polyisocyanate, melamine or a combination thereof.
12. The coating composition of claim 11 wherein a ratio of
15 equivalents of isocyanate functionalities on said polyisocyanate per equivalents of all the functional groups present in the crosslinking component ranges from 0.5/1 to 3.0/1.
13. The coating composition of claim 11 comprising 0.1 weight
20 percent to 40 weight percent of said melamine, wherein said percentages are based on total weight of composition solids.
14. The coating composition of claim 12 further comprising a catalytically active amount of one or more catalysts.
15. The coating composition of claim 13 further comprising a
25 catalytically active amount of one or more acid catalysts.
16. The coating composition of claim 1 further comprising an acrylic polymer, polyester or a combination thereof.
17. The coating composition of claim 1 wherein said crosslinkable component further comprises one or more reactive oligomers.
18. The coating composition of claim 1 further comprising a
30 modifying resin.
19. The coating composition of claim 1 further comprising pigments, special effect pigments and a combination thereof.
20. The coating composition of claim 1 formulated as a two-pack
35 coating composition.

21. The coating composition of claim 1 or 20 formulated as an automotive OEM composition.

5 22. The coating composition of claim 1 or 20 formulated as an automotive refinish composition.

23. The coating composition of claim 1 or 20 formulated as a low VOC coating composition comprising a solvent ranging of from 0.1 kilograms (1.0 pounds per gallon) to 0.72 kilograms (6.0 pounds per gallon) per liter of said composition.

10 24. The coating composition of claim 1 wherein said crosslinkable component comprises 2 weight percent to 25 weight percent of one or more acid functional acrylic copolymers, all percentages being based on the total weight of the crosslinkable component.

25. A process for producing a coating on a substrate comprising:

15 (a) mixing a cross-linkable component of a coating composition with a crosslinking component of said coating composition to form a pot-mix, said crosslinkable component comprising an acid functional acrylic copolymer polymerized from a monomer mixture comprising 2 weight percent to 12 weight percent of carboxylic acid group containing monomer based on total weight of the
20 acid functional acrylic copolymer, and 0.2 weight percent to 2 weight percent of amorphous silica based on total weight of the crosslinkable component;

(b) applying a layer of said pot-mix over said substrate; and

(c) curing said layer into said coating on said substrate.

25 25. The process of claim 24 wherein said curing step takes place under ambient conditions, at elevated temperatures, or under ambient conditions followed by elevated temperatures.

26. The process of claim 24 wherein said substrate is an automotive body.